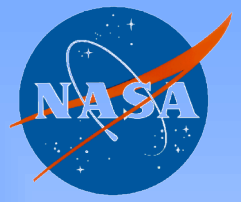


National Aeronautics and
Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

AIRS User Services

AIRS Science Team Meeting
May 3–6, 2005

Edward.T.Olsen@JPL.NASA.GOV
California Institute of Technology
Jet Propulsion Laboratory

6 May 2005

National Aeronautics and
Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Outline

- **AIRS Version 4.0 Release User Documentation**
  - Significant Changes from V3 to V4
- **AIRS Data User Registration on Web**
- **AIRS Data User Q&A on Web**
- **Subsetting Capabilities at GSFC DAAC**
  - Procedure
  - Options

- **URLs of interest to AIRS Data users**
  - **Public Web Page: http://airs.jpl.nasa.gov/**
  - **Team Web Page: http://airsteam.jpl.nasa.gov/**
  - **AIRS Data Support at DAAC: http://disc.gsfc.nasa.gov/AIRS/index.shtml/**
  - **AIRS DATA on DATA POOL: http://daac.gsfc.nasa.gov/data/datapool/AIRS/index.html**
  - **Submit Questions about AIRS at URL:**
    http://airs-inquiry.jpl.nasa.gov/feedback/feedback_form.cfm
  - **Register for Announcements and Newsletter at URL:**
    http://airs-inquiry.jpl.nasa.gov/DataRegistration/data/index.cfm

National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

AIRS V4.0 Release User Documentation

Validation Report	
V4.0_Validation_Report	Core Products Validation Report

User Guide	
V4.0_Data_Release_UG	Main User Guide, refers to supporting docs
V4.0_Data_Disclaimer	Important Disclaimer

Supporting Documentation	
V4.0_RetQAFlag	Primary Flag for Data Selection
V4.0_L2_QualFlag_QuickStart	Hierarchy of L2 Quality Flags for More Sophisticated Data Selection
AIRS_L2_levels_and_layers	Explanation of AIRS Levels and Layers
V4.0_L1B_QA_Quick_Start	Hierarchy of L1B Quality Assurance Parameters
Selected_AIRS_QA_Fields	AIRS Radiance QA Fields controlled by Calibration
MW_L1B_Assessment	Assessment of AMSU/HSB L1B Radiances
VisInitialCheckout	Report on initial Vis/NIR on-orbit checkout (6/12/2002)
VisGainCalibration	Report on vicarious calibration for Vis/NIR (9/27/2002)
L1B_req_v2.2	AIRS/VIS/NIR L1B Processing input/output description
l1bqa_changes	Modifications to L1B_req_v2.2 (2/4/2003)
V4.0_Release_ProcFileDesc	Complete description of contents of released products
L2.chan_prop.2002.08.30.v8.1.0.txt	channel properties file, 20020830 to 20020917
L2.chan_prop.2002.09.17.v8.1.0.txt	channel properties file, 20020917 to 20021022
L2.chan_prop.2002.10.22.v8.1.0.txt	channel properties file, 20021022 to 20030110
L2.chan_prop.2003.01.10.v8.1.0.txt	channel properties file20030110 to 20031119
L2.chan_prop.2003.11.19.v8.1.0.txt	channel properties file20031119 to present

Sample Readers	
IDL READERS	
read_L12_swath_file.pro	IDL procedure to read L1B and L2 product files
read_L3_grid_file.pro	IDL procedure to read L3 product files
MATLAB READERS	
read_L12_swath_file.m	MATLAB module to read L1B and L2 product files
read_L3_grid_file.m	MATLAB module to read L3 product files
V4.0_FORTRAN_C_Readers	Cover document describing package of FORTRAN and C readers for L1B and L2 product files and utilities to choose and read channel properties files and report L1B IR QA
C READERS	
vnir_rad_rdr.c	L1B Visible/near IR data product reader
vnir_rad_rdr.h	Header for vnir_rad_rdr.c
amsua_bt_rdr.c	L1B AMSU-A microwave data product reader
amsua_bt_rdr.h	Header for amsua_bt_rdr.c
hsb_bt_rdr.c	L1B HSB microwave data product reader
hsb_bt_rdr.h	Header for hsb_bt_rdr.c
airs_rad_rdr.c	L1B AIRS IR data product reader
airs_rad_rdr.h	Header for airs_rad_rdr.c
airs_cc_rad_rdr.c	L2 AIRS Cloud-Cleared IR data prduct reader
airs_cc_rad_rdr.h	Header for airs_cc_rad_rdr.c
airs_ret_rdr.c	L2 AIRS geophysical data product reader
airs_ret_rdr.h	Header for airs_ret_rdr.c
FORTRAN READERS	
vnir_rad_rdr.f	L1B Visible/near IR data product reader
vnir_ad_rdr.inc	Include file for vnir_rad_rdr.f
amsua_bt_rdr.f	L1B AMSU-A microwave data product reader
amsua_bt_rdr.inc	Include file for amsua_bt_rdr.f
hsb_bt_rdr.f	L1B HSB microwave data product reader
hsb_bt_rdr.inc	Include file for hsb_bt_rdr.f
airs_rad_rdr.f	L1B AIRS IR data product reader
airs_rad_rdr.inc	Include file for airs_rad_rdr.f
airs_cc_rad_rdr.f	L2 AIRS Cloud-Cleared IR data prduct reader
airs_cc_rad_rdr.inc	Include file for airs_cc_rad_rdr.f
airs_ret_rdr.f	L2 AIRS geophysical data product reader
airs_ret_rdr.inc	Include file for airs_ret_rdr.f
UTILITIES	
read_chan_props.c	Read a channel properties file
airs_chan_props.h	Header for read_chan_props.c
select_chan_props.c	Select proper chan properties file based on date
airs_rdr_test.c	access and report L1B AIRS IR QA information

Important New Documents

- Validation Report
- User Guide & Disclaimer
- L2 QualFlag QuickStart
- Released ProcFileDesc
- Readers in IDL, MATLAB, FORTRAN, C

National Aeronautics and Space Administration
Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Significant Changes from V3 to V4

- **Level 3 Gridded Product Added**
  - Daily, 8-day and monthly products
  - ATOVS convention, break at longitude ±180°, hence for images:
    - Eastern hemisphere night is aggregate of descending granules for dates "N" and "N+1" to remove discontinuity in time
      - **Users cross-comparing maps/images — MODIS E. hemisphere night grid is different**
    - Ascending granules for single date are aggregated
- **Level 2 Quality Flags Expanded**
  - Increased yield of data for research in upper atmosphere beyond what would be available using shotgun approach, "RetQAFlag=0"
- **Collection 3 (without HSB) and Collection 4 (with HSB) Created**
  - HSB ceased operation February 5, 2003
- **L1B & L2 CC AIRS Radiance Products Reduced by Half**
  - 32-bit word precision reduced to that of measurement
  - Internal HDF-EOS compression, "deflate", applied
- **Nighttime (Descending) VIS/NIR Product Removed**
  - Empty data set, previously filled with "bad float"

National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

AIRS Data User Registration on the Web

http://airs-inquiry.jpl.nasa.gov/DataRegistration/data/index.cfm

- New with Version 4.0
- Links at DAAC to registration page at JPL
- Goal is to better serve AIRS data users by increasing two–way communication
- Those who register will receive AIRS Project newsletter as well as announcements of documentation changes, bug fixes, discovered features and caveats directly applicable to their research

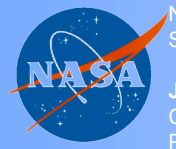
National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

AIRS Data User Q&A on the Web

http://airs-inquiry.jpl.nasa.gov/feedback/feedback_form.cfm

- 133 questions to date
- Response usually sent within 24 hours unless question requires some research or consultation with other team members
- Topics range from general overview through data content to detailed queries about calibration, validation and hardware



National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Subsetting Capabilities at GSFC DAAC

- **GSFC DAAC Supports Subsetting of AIRS Products**
  - AIRS/AMSU/HSB/Vis-NIR L1B Radiances
  - AIRS L2 Cloud Cleared Radiances
  - AIRS L2 Standard Product
  - AIRS L2 Support Product
- **Procedure for Data Pool**
  - Select Product Level (L1B, L2 or L3)
  - Select Product (e.g., L1B-AIRS-IR-Rad,L2-RetStd, L2-CC)
  - Select Year (2002, 2003, 2004, 2005)
  - Select Day of Month
  - Limit Geolocation (lat/lon min/max) and Search for Granules
  - Select Granules from List and Specify Subset Desired
  - Choose Delivery Method: individual granules or tar file of many
  - Submit Request

National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Subsetting Options for AIRS L1B/L2CC Radiance Products

Instructions for data CHANNEL/VARIABLE subsetting:

1. Select AIRS Infrared channels for subsetting using one of the following options (**Note:** Maximum of 1000 channels can be selected):
   - **Option 1:** Select wavenumber ranges out of Golden Set of Channels, lists of favorite channels for the AIRS.

Select	Hardware Module	Frequency Range	Channel Number Range	Number of Channels	Comments
☐	All	649.61 - 2665.24cm^{-1}	1 - 2378	323	The Numerical Weather Prediction sets
☐	M-12	649.61 - 681.99cm^{-1}	1 - 130	130	Long-wave temperature sounding
☐	M-11	687.60 - 728.44cm^{-1}	131-274	143	Long-wave temperature sounding
☐	M-10	728.06 - 781.88cm^{-1}	275 - 441	166	Long-wave surface
☐	M-09	789.26 - 852.43cm^{-1}	442 - 608	166	Long-wave surface
☐	M-08	851.49 - 903.78cm^{-1}	609 - 769	160	Long-wave surface
☐	M-07	911.24 - 974.29cm^{-1}	770 - 936	166	Long-wave surface
☐	M-06	973.82 - 1046.20cm^{-1}	937 - 1103	166	Ozone
☐	M-05	1056.10 - 1136.66cm^{-1}	1104 - 1262	158	Long-wave surface, Ozone
☐	M-04d	1216.97 - 1272.59cm^{-1}	1263 - 1368	105	Water vapor
☐	M-04c	1284.35 - 1338.86cm^{-1}	1369 - 1462	93	Water vapor, methane
☐	M-03	1338.16 - 1443.07cm^{-1}	1463 - 1654	191	Water vapor
☐	M-04b	1460.27 - 1527.00cm^{-1}	1655 - 1760	105	Water vapor
☐	M-04a	1541.10 - 1613.86cm^{-1}	1761 - 1864	103	Water vapor
☐	M-02b	2181.50 - 2325.06cm^{-1}	1865 - 2014	149	Shortwave temperature sounding, CO
☐	M-01b	2299.80 - 2422.85cm^{-1}	2015 - 2144	129	Shortwave temperature sounding
☐	M-02a	2446.20 - 2569.75cm^{-1}	2145 - 2260	115	Shortwave Surface
☐	M-01a	2541.90 - 2665.24cm^{-1}	2261 - 2378	117	Shortwave Surface

   - **Option 2:** Use a text form to specify multiple channel numbers or multiple ranges (e.g., **1 2 3 4 5** or **1-5**), or wavenumbers in cm^{-1} (e.g., **650 660 670** or **1100-1300**).

     Channel Number: [ ] or Wavenumber: [ ] cm^{-1}

2. Select file compression format: [Non-compressed granules]
3. Click on the "Submit SUBSET Request" button.

   [Submit SUBSET Request] [Reset]

National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Subsetting Options for Vis-NIR/AMSU/HSB L1B Radiance Products

Instructions for data CHANNEL/VARIABLE subsetting:

1. Specify AIRS VIS/NIR channels for subsetting:

☐ (1) 0.44 ☐ (2) 0.63 ☐ (3) 0.82 ☐ (4) 0.72

2. Select file compression format: Non-compressed granules
3. Click on the "Submit SUBSET Request" button.

Submit SUBSET Request | Reset

Instructions for data CHANNEL/VARIABLE subsetting:

1. Specify AIRS AMSU channels (GHz) for subsetting:

☐ (01) 23.800 ☐ (02) 31.400 ☐ (03) 50.300 ☐ (04) 52.800
☐ (05) 53.481 ☐ (06) 54.400 ☐ (07) 54.940 ☐ (08) 55.500
☐ (09) 57.290 ☐ (10) 57.073 ☐ (11) 56.920 ☐ (12) 56.946
☐ (13) 56.958 ☐ (14) 56.964 ☐ (15) 89.000

2. Select file compression format: Non-compressed granules
3. Click on the "Submit SUBSET Request" button.

Submit SUBSET Request | Reset

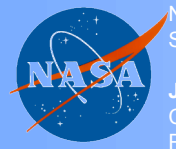
Instructions for data CHANNEL/VARIABLE subsetting:

1. Specify AIRS HSB channels (GHz) for subsetting:

☐ (1) 150.0 ☐ (2) 184.31 ☐ (3) 186.31 ☐ (4) 190.31

2. Select file compression format: Non-compressed granules
3. Click on the "Submit SUBSET Request" button.

Submit SUBSET Request | Reset



National Aeronautics and
Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Subsetting Options for L2 Std/Sup Geophysical Products

Instructions for data CHANNEL/VARIABLE subsetting:

1. Select AIRS Level 2 Standard Retrieval Data Set variable(s) for subsetting: Select All | Clear

☐ Surface Skin Temperature	☐ Microwave Surface Brightness
☐ Surface Air Temperature	☐ Microwave Emissivity
☐ Atmospheric Temperature	☐ Total Cloud Liquid Water
☐ Water Vapor Mass Mixing Ratio	☐ Cloud Top Temperature
☐ Total Precipitable Water Vapor	☐ Cloud Top Pressure
☐ Ozone Volume Mixing Ratio	☐ Effective Cloud Fraction
☐ Total Ozone Burden	☐ Geopotential Heights at StdPressureLev
☐ Spectral IR Surface Emissivities	☐ Geopotential Heights of Surface
☐ Spectral IR Surface Bidirect Reflectivity	

2. Select file compression format: Non-compressed granules
3. Click on the "Submit SUBSET Request" button.

Submit SUBSET Request | Reset

Instructions for data CHANNEL/VARIABLE subsetting:

1. Select AIRS Level 2 Standard Retrieval Data Set variable(s) for subsetting: Select All | Clear

☐ Surface Skin Temperature	☐ Methane Column Density
☐ Surface Air Temperature	☐ Outgoing Longwave Radiation
☐ Atmospheric Temperature	☐ Clear-sky Outgoing Longwave Radiation
☐ Water Vapor Column Density	☐ Cloud IR Emissivity Ratio
☐ Cloud Liquid Water	☐ Cloud IR Reflectivity
☐ Cloud Ice/Water Flag	☐ Precipitation
☐ Ice/Snow Concentration	☐ Rain Rate
☐ Ozone Column Density	
☐ Carbon Monoxide Column Density	

2. Select file compression format: Non-compressed granules
3. Click on the "Submit SUBSET Request" button.

Submit SUBSET Request | Reset